Missouri Department of Natural Resources

Total Maximum Daily Load Information Sheet

Turkey Creek

Waterbody Segment at a Glance:


State map showing location of watershed

County: St. Francois
Nearby Cities: Bonne Terre
Length of impairment: 1.5 miles
Pollutants: Biochemical Oxygen Demand (BOD)
Volatile Suspended Solids (VSS)
Source: Bonne Terre Wastewater (WV

TMDL Priority Ranking: TMDL approved 2005

Description of the Problem

Beneficial uses of Turkey Creek

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health associated with Fish Consumption

Use that is impaired

- Protection of Warm Water Aquatic Life

Standards that apply

- The Missouri Water Quality Standard (WQS), found in 10 CSR 20-7.031 Table A, for dissolved oxygen (related to Biochemical Oxygen Demand, or BOD) in streams is 5.0 mg/L (milligrams per liter or parts per million) or the natural dissolved oxygen profile of the stream, whichever is less.
- The standards for volatile suspended solids (VSS) may be found in the general criteria section of the WQS at 10 CSR 20-7.031(3)(A) and (C). Here it states:
  - Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses.
  - Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses.

Background Information and Water Quality Data

Any waterbody that was listed for Non-filterable Residue (NFR) in 1998, such as Turkey Creek, is now being listed for Volatile Suspended Solids (VSS). This change was made to better

distinguish between organic solids coming from wastewater treatment plants (VSS) and mineral solids (soil or mineral particles) coming from soil erosion or erosion of mine waste materials or stockpiles (Non-Volatile Suspended Solids or NVSS).

Wastewater high in Biochemical Oxygen Demand (BOD) reduces the amount of dissolved oxygen in the stream's water. Most aquatic organisms require high levels of oxygen to survive. In addition, volatile suspended solids (VSS), also known as suspended solids, can settle onto the bottom of a stream smothering natural substrates (materials in the streambed), aquatic invertebrate animals and fish eggs.

Past surveys by the department have noted little aquatic life in Turkey Creek. Two possible reasons for this include discharges from the Bonne Terre Wastewater Treatment Plant (WWTP) and chronic bypassing of raw sewage by a lift station located next to Turkey Creek. Like all wastewater discharges in Missouri, the Bonne Terre WWTP has to meet the requirements of a discharge permit issued by the department. The TMDL proposes limits for that permit so the discharge should not cause the creek to exceed WQS. The TMDL was approved by the Environmental Protection Agency January 13, 2005.

Results of water quality studies conducted in July and August 2002 of the Bonne Terre WWTP and Turkey Creek are summarized in the tables below (map of sample sites is on the next page).

Mean (average) Early Morning Water Quality of Turkey Creek, July 23-24, 2002

Site #	Flow (ft^3/sec)	DO (mg/L)	CBOD (mg/L)	O-N (mg/L)	NH_3-N (mg/L)	NO_3-N (mg/L)	TP (mg/L)	TSS (mg/L)	VSS (mg/L)
1	0.05	3.7	1.1	0.28	<0.05	0.07	0.07	6	<5
2		4.7	2.5	0.28	0.8	0.25	3.23	16	15
3	0.21	4.79	42	11	<0.05	<0.05	6.73	124	106
4		2.44	20	2.04	2.37	0.15	6.47	7	<5
5	0.004	4.4	3	<1	0.42	0.91	0.25	8	<5
6	0.26	3.3	5	5	2.6	0.34	6.46	8	9
7		3.15	<2	<1	<0.05	<0.05	0.05	8	<5
8	0.66	4.75	2.75	1.78	0.4	1.52	4.47	12.5	3

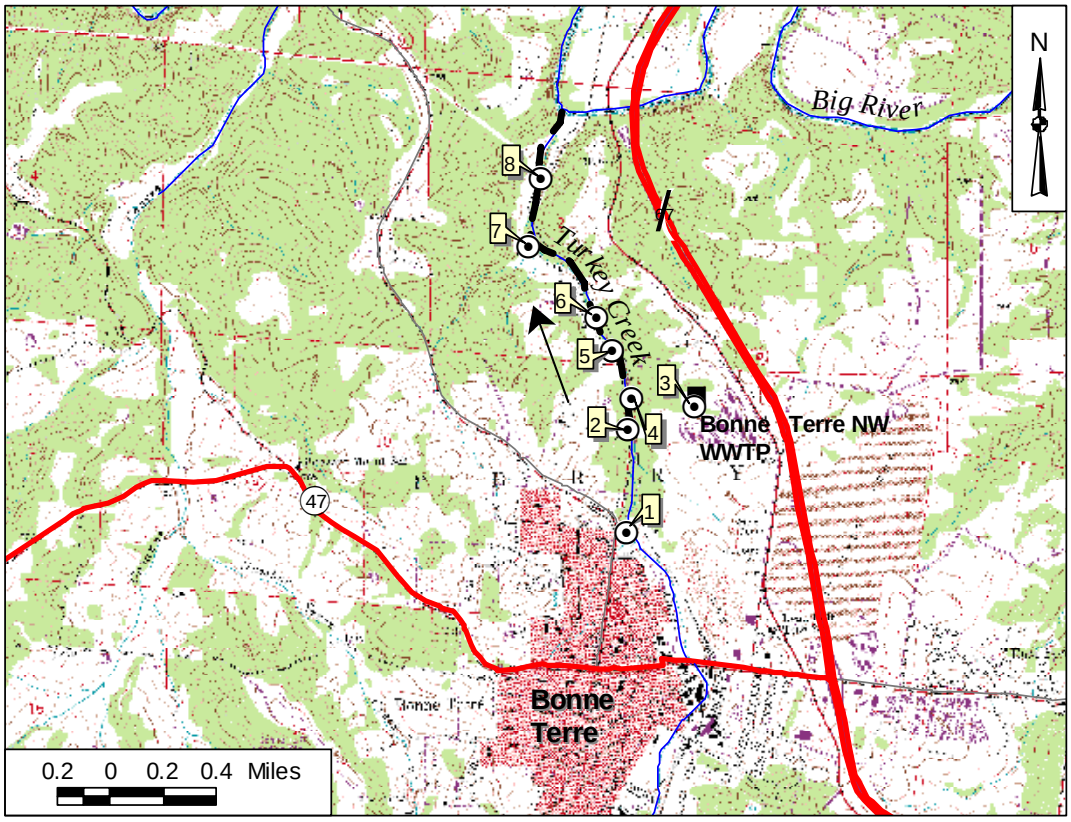
DO=Dissolved Oxygen, CBOD=Carbonaceous Biochemical Oxygen Demand (related to BOD), O-N=Organic Nitrogen, NH_3-N=Ammonia as Nitrogen, NO_3-N=Nitrate as Nitrogen, TP=Total Phosphorus, TSS= Total Suspended Solids, VSS=Volatile Suspended Solids.

Mean (average) Early Morning Water Quality of Turkey Creek, August 28-29, 2002

Site #	Flow (ft^3/sec)	DO (mg/L)	CBOD (mg/L)	O-N (mg/L)	NH_3-N (mg/L)	NO_3-N (mg/L)	TP (mg/L)	TSS (mg/L)	VSS (mg/L)
1	0.04	9.4	<2	<0.1	<0.05	0.36	<0.05	<5	<5
2	1.8	8.1	<2	0.2	<0.05	0.38	0.71	6	<5
3	0.57	6.72	<2	1.3	0.16	1.28	5.2	7	<5
5	0.04	6.07	3	0.83	0.32	1.25	0.41	11	5
6	2.9	7.3	<2	0.9	<0.05	1.0	3.38	8	<5
7	0.08	4.9	<2	0.15	<0.05	<0.05	0.05	7.5	<5
8	2.65	8.0	<2	0.57	<0.05	0.89	2.07	6	<5

Turkey Creek in St. Francois County, Missouri,

Showing the Impaired Segment and Sampling Sites



Impaired Segment Direction of flow

Site Index

1 – Turkey Creek 0.5 mile upstream of WWTP tributary
2 – Turkey Creek 0.1 mile upstream of WWTP tributary
3 – Bonne Terre WWTP outfall
4 – Effluent tributary near mouth
5 – 2nd tributary to Turkey Creek near mouth
6 – Turkey Creek 0.5 mile downstream of Bonne Terre WWTP
7 – 3rd tributary to Turkey Creek near mouth
8 – Turkey Creek 1.2 mile downstream of Bonne Terre WWTP

For more information call or write:

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